université PARIS-SACLAY
FACULTÉ DE PHARMACIE

Graduate School: Health and Drug Research
Master 2 Pharmaceutical Technology and Biopharmacy

Company/laboratory/public institution: MEDINCELL SA

Address: **3 rue des Frères Lumière**

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Supervision of trainee:

Name of tutor: Camille DULAC

Position: Research & Innovation Associate

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Internship period: 20 January - 18 July 2025

Title of the project:

MedinCell is a clinical-stage company developing long-acting injectable (LAI) products for the delivery of active ingredients. The BEPO® technology developed by MedinCell makes it possible to control and sustain the delivery of the formulated molecule from a few weeks up to several months. UZEDY™, a 1-month or 2-month risperidone formulation based on BEPO® technology was approved last year by the FDA for the treatment of schizophrenia and is currently commercialized in the US by Teva Pharmaceuticals. The technology is based on mixing three main components: biodegradable (PEG-PLA) copolymers, an Active Pharmaceutical Ingredient (API) and a biocompatible solvent. Once injected subcutaneously, the liquid formulation will quickly precipitate and form a solid depot entrapping the API in a non-covalent manner within the copolymer matrix. This *in situ* forming biocompatible depot will act as an API reservoir: the desired quantity of active ingredient will gradually be released over time with a kinetics that can be tuned by playing on the formulation variables. Even though the technology is very versatile, it has some limitations, especially, when formulating APIs with atypical physico-chemical properties.

In this context, the candidate will join the Research & Innovation department of the company that regroups researchers with a vast array of skills from polymer chemistry to pharmaceutical sciences, protein engineering and cell biology. He/She will be responsible for the design and evaluation of formulations integrating novel copolymers made by the polymer team. The impact of these different scaffolds and their impact on the depot properties and formulation performance will be investigated. In particular, using one or two model APIs, the impact of the copolymer structure (hydrophobicity, chain length, compatibility with API) on the depot formation, API release kinetics, and polymer degradation will be studied. Potential interactions between the API and the polymers will also be probed using Isothermal Titration Calorimetry (ITC). Analytical characterization methods such as HPLC, GPC or Rheometry will be used to monitor the formulation main variables. The analysis of the data and interpretation of the results will be part of the intern’s tasks.